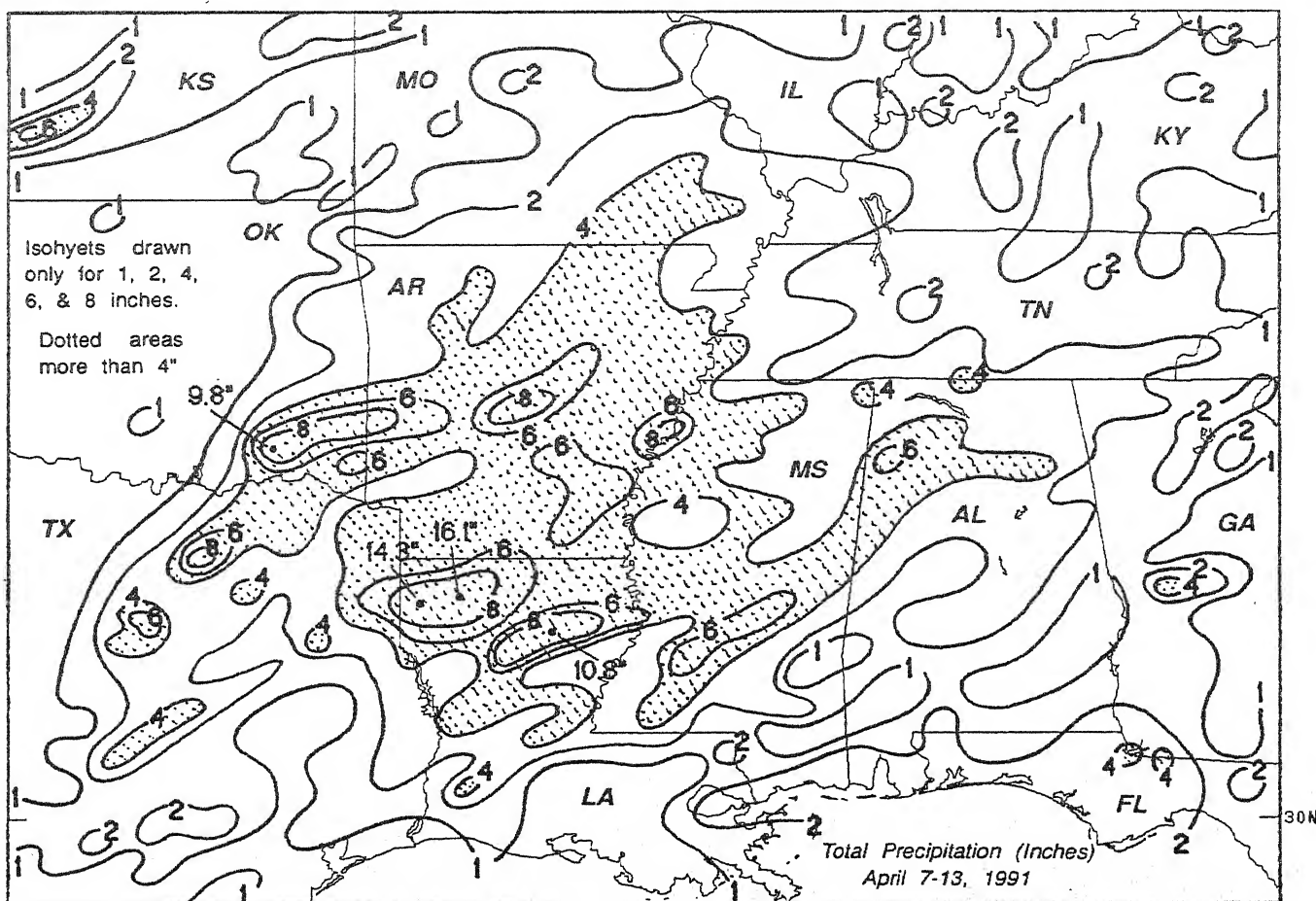


WEEKLY CLIMATE BULLETIN

No. 91/15

Washington, DC

April 13, 1991



Slow-moving cold fronts triggered numerous thunderstorms across the Deep South on two separate occasions during the week. There were nearly 400 reports of severe weather across the region on Tuesday, including damaging winds, large hail, and approximately 40 tornadoes. Three days later, more than 500 homes were flooded as inundating rainfall (up to 10 inches in 12 hours) pounded northwestern Louisiana, where weekly totals reached 16.1 inches (see United States Weekly Climate Highlights for more details).



UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE-NATIONAL METEOROLOGICAL CENTER
CLIMATE ANALYSIS CENTER



WEEKLY CLIMATE BULLETIN

This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- *Highlights of major climatic events and anomalies.*
- *U.S. climatic conditions for the previous week.*
- *U.S. apparent temperatures (summer) or wind chill (winter).*
- *U.S. cooling degree days (summer) or heating degree days (winter).*
- *Global two-week temperature anomalies.*
- *Global four-week precipitation anomalies.*
- *Global monthly temperature and precipitation anomalies.*
- *Global three-month precipitation anomalies (once a month).*
- *Global twelve-month precipitation anomalies (every three months).*
- *Global three-month temperature anomalies for winter and summer seasons.*
- *Special climate summaries, explanations, etc. (as appropriate).*

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Climate Analysis Center via the Global Telecommunications System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF APRIL 13, 1991

1. Southwestern Alaska:

ABNORMALLY DAMP CONDITIONS CEASE.

Typically low April weekly precipitation totals were measured, reducing moisture surpluses [Ended after 6 weeks].

2. Western United States:

WET AND COOL SPELLS END.

Most locations in the northern Sierras measured 5–15 mm of precipitation while only 2–5 mm fell across the southern Sierras. In addition, up to 30 mm were reported at isolated locations along the central and northern coast. The majority of the region, however, received no measurable precipitation, eliminating short-term moisture surpluses [Ended after 7 weeks]. Near normal temperatures were observed along the coast while inland temperatures averaged only slightly below normal, bringing the region's cool spell to an end [Ended after 5 weeks].

3. Central United States:

HEAVY PRECIPITATION PLAGUES REGION.

The sporadic wetness that has affected various parts of the central and eastern U.S. since early 1989 has re-developed. During the past three weeks, 125–500 mm of rain has soaked extreme southern and southeastern Texas as well as northwestern Louisiana while 100–200 mm have fallen on most of the lower Mississippi and Tennessee Valleys, western Deep South, and central and northeastern Iowa. In addition, generally 50–100 mm has dampened the remainder of Iowa, southern Kansas, eastern sections of Kansas and Nebraska, Missouri, the Great Lakes, the southern Corn Belt, and the lower Ohio Valley. Well over twice normal rainfall has accumulated at some locations, particularly in western areas [3 weeks].

4. West-Central South America:

WARM WEATHER CONTINUES.

Weekly temperatures again averaged 2°C to 4°C above normal [6 weeks].

5. East-Central South America:

INUNDATING RAINS ABRUPTLY END DRY SPELL.

Only 10–25 mm dampened extreme southern Uruguay and adjacent Argentina, but most of Uruguay, northeastern Argentina, and adjacent Brazil measured 50–160 mm of rain, with totals reaching 245 mm in isolated parts of northeast Argentina. The rains significantly alleviated short-term deficits in most places, leaving six-week shortfalls of 60–115 mm across the aforementioned drier locations [Ended after 6 weeks].

6. Ireland and Scotland:

ABNORMALLY WET WEATHER DEVELOPS.

For the second consecutive week, unusually large rainfall totals (weekly amounts

of 20–60 mm) were measured across Scotland and Ireland, renewing moisture surpluses that had accumulated during mid-February to mid-March [2 weeks].

7. Central and Eastern Europe:

PROLONGED DRY PERIOD GRADUALLY ENDS.

Widespread light precipitation (5–20 mm), with higher amounts across the southern tier of the region, helped end the dryness that has been slowly subsiding during the past month; however, isolated short-term moisture deficits remain across the Benelux region, southeastern Poland and eastern Hungary, central Romania, and interior sections of the Ukraine [Ended after 17 weeks].

8. The Middle East:

COOLER WEATHER DEVELOPS BUT WETNESS PERSISTS.

Near to below normal weekly temperatures brought an end to the recent warmth [Ended after 4 weeks], but unusually heavy rains continued, increasing moisture surpluses in most areas. The western three-fourths of Turkey, Greece, western Syria, and Israel measured 25–60 mm while lesser totals (10–25 mm) dampened eastern Turkey and northern Iran. Since early March, departures up to 99 mm have accumulated in Syria while a 145 mm surplus was reported in Tehran [4 weeks].

9. Southeastern Africa:

A SECOND DRY WEEK ALLEVIATES RECENT MOIST SPELL.

Little or no rain fell throughout the region for the second consecutive week, ending brief moisture surpluses [Ended after 6 weeks].

10. Japan and East-Central China:

WIDESPREAD HEAVY RAINS.

The southern half of Honshu, Kyushu, Shikoku, and east-central China measured 40–90 mm of rain, enlarging short-term excess moisture. Northern sections of Honshu were slightly drier, measuring only 20–50 mm, but excessively heavy rains soaked the southern coasts of Honshu, Kyushu, and Shikoku, where 90–190 mm were recorded. Very large rainfall surpluses have accumulated during the past six weeks, reaching 200–320 mm in portions of central and southern Japan [9 weeks].

11. The Philippines:

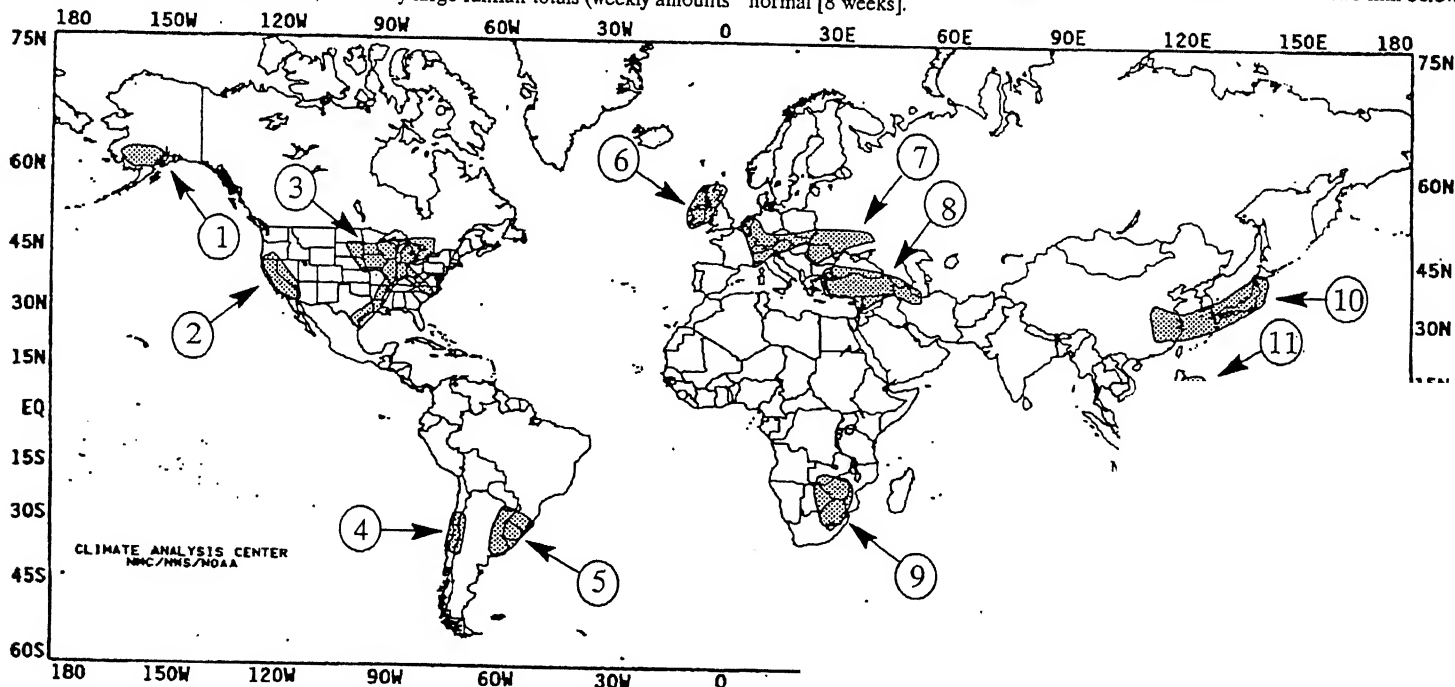
ANOTHER DRY WEEK.

Widely scattered showers brought isolated 20–50 mm rainfall totals to the eastern fringes of the islands, but little or no rain in most areas allowed accumulated deficits to remain high [19 weeks].

12. Northern and Eastern Australia and Papua New Guinea:

LIGHT RAINFALL MAINTAINS THE REGION'S DEFICITS.

Totals of 30–70 mm were scattered throughout northeastern coastal Australia and eastern Papua New Guinea, keeping six-week rainfall totals 100–320 mm below normal [8 weeks].



EXPLANATION

TEXT: Approximate duration of anomalies is in brackets. Precipitation and ten
MAP: Approximate locations of major anomalies and episodic events are shown. Temperature anomalies, four-week precipitation anomalies, longer-term

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF APRIL 7-13, 1991

Severe weather dominated the week's weather stories as an explosive storm system affected a large portion of the country. Violent thunderstorms spawned numerous tornadoes from the Pacific Northwest to the Deep South while heavy rains (up to 16 inches) inundated parts of the Plains and the Tennessee and Mississippi Valleys. The hardest hit area was northwest Louisiana, where up to ten inches of rain fell in just over 12 hours on Friday, flooding as many as 500 homes and causing up to \$5 million damage. There were nearly 400 reports of severe weather on Tuesday from Washington to Georgia. A tornado, rarely observed in the Pacific Northwest, touched down near Seattle, WA, accompanied by baseball-sized hail. Meanwhile, thunderstorms produced hail 5 inches in diameter near Lahoma, OK. Hurricane-force wind gusts accompanied many of the storms from the Midwest to the mid-Atlantic, damaging homes and knocking down trees and power lines. Two people were killed after thunderstorms with powerful wind gusts roared through a mobile home park in Malden, WV. Summer-like conditions enveloped parts of the upper Midwest and East early in the week with highs reaching to 90°F as far north as Hartford, CT (see Figure 1). The warm weather combined with heavy rain to produce ice jam flooding on the St. John River in northern Maine, forcing the evacuation of nearly 200 people. Backed-up water was 20 feet deep near Dickey, ME. The ice jam destroyed two bridges as it eventually pushed downstream while flood waters swept as many as two dozen homes from their foundations. Farther west, winter-like conditions prevailed over parts of the Rockies, Great Plains and upper Midwest. As much as 80 inches of snow fell near Red Lodge, MT while up to 3 feet blanketed the Big Horn and Wind River Mountains in Wyoming. Strong winds created snow drifts up to 6 feet deep, and blowing snow reduced visibilities to near zero in eastern Wyoming. Numerous roads were closed in Montana and Wyoming after becoming impassable, and some ski resorts decided to re-open after the storm.

The week began with unseasonably warm weather across the upper Midwest and Northeast. More than 50 daily record highs were established on Sunday and Monday from Minnesota to Maine. Highs soared to 90°F at a few locations in the Northeast and mid-Atlantic while some cities in the upper Midwest measured highs more than 30°F above normal. To the west, an area of low pressure organized along a cold front in the nation's midsection, triggering numerous thunderstorms as it pushed eastward. The storms spawned more than 3 dozen tornadoes on Tuesday from the Great Lakes to the Deep South. Softball-sized hail and wind gusts over 80 mph accompanied some of the storms, knocking out power to over 50,000 residents from Illinois to West Virginia. Heavy rains inundated some areas, causing localized flooding from lower Michigan to the lower Mississippi River Valley. In sharp contrast, heavy snow blanketed parts of the northern Plains two days after highs reached into the seventies. Farther west, a cold front pushed into the Pacific Northwest, breeding heavy rain across the western halves of Washington and Oregon and generating severe weather near Seattle, WA.

During the last half of the week, the low pressure system in the Midwest and its associated cold front raced rapidly eastward. Unseasonably warm conditions earlier in the week across the East were replaced by sharply colder conditions, with lows dipping into the twenties from Maine to West Virginia. Farther west, a major spring storm developed over the Rockies. Heavy snow fell across most of the Rockies,

with up to 5 feet burying portions of Montana. Strong winds and low temperatures combined to produce blizzard-like conditions across portions of the Rockies, forcing numerous roads to close. The storm slowly moved into the central Plains, where it continued to intensify. Wintry conditions prevailed north of the storm while strong and often violent thunderstorms erupted further south. Heavy rains inundated eastern portions of the central and southern Plains as well as parts of the lower Mississippi River Valley. Flash flooding resulted when some of the storms dropped several inches of rain during relatively short periods of time. Highway 71 near Mena, AR was closed after 3 feet of water covered the road and flooding washed-out a bridge in Antlers, OK after 4 inches of rain fell in a 6-hour period. Reports of tornadoes, hail, and high winds were common across much of the central U.S. as the storm system inched toward the Great Lakes. In sharp contrast, heavy snow fell from the northern Plains to the upper Midwest with nearly a foot of snow measured in the Black Hills. Record cold settled in behind the storm, producing lows into the single-digits across Colorado's higher elevations.

According to the River Forecast Centers, the greatest weekly totals (more than 5 inches) were measured in much of northeast Texas, southeast Oklahoma, and the lower Mississippi Valley (see Table 1). Scattered heavy amounts were also observed in northern Florida, central Iowa and Kansas, and southern Alaska. More than two inches of precipitation was measured in northern New England, portions of the central and southern Appalachians, the northern and western Great Lakes, the Ohio and Tennessee Valleys, the remainder of the lower Mississippi Valley, the Deep South, eastern Texas, portions of the middle and upper Mississippi Valley, eastern sections of the central Plains, parts of the Rockies and the western halves of Washington and Oregon. Moderate amounts fell on the northern half of Florida, interior sections of the mid-Atlantic and Northeast, and the remainders of the Great Lakes, Ohio Valley, upper Midwest, eastern Plains, Rockies and Pacific Northwest. Little or no precipitation was observed along the coastal Atlantic, across southern Florida, in the southern High Plains, and through the Southwest, Intermountain West and the Far West.

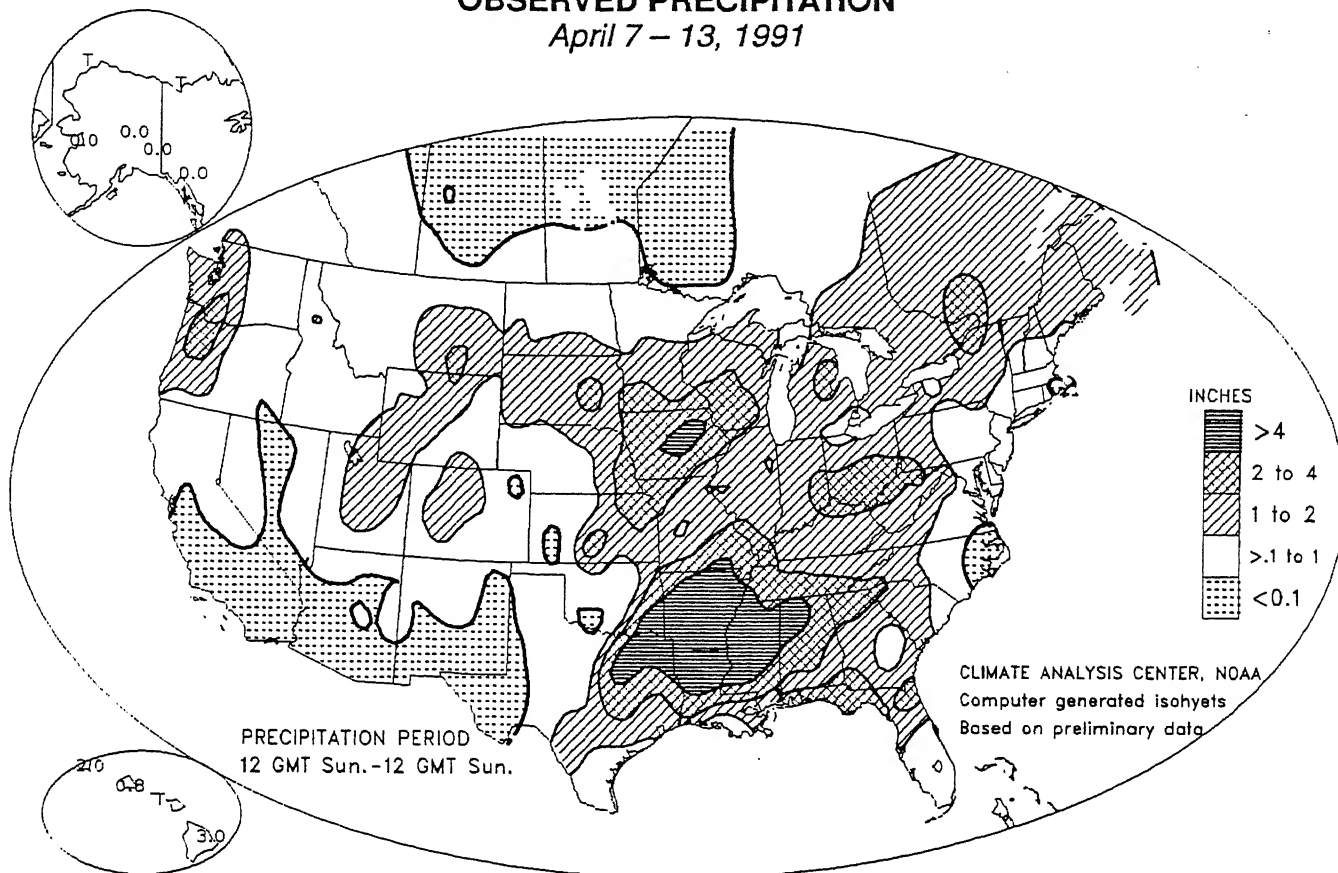
Unseasonably warm conditions prevailed over the eastern half of the nation. Summer-like weather early in the week across much of the Northeast was sufficient to produce weekly departures between +8°F and +12°F despite a brief blast of much cooler air later in the week (see Table 2). Departures up to +9°F were observed at a few locations in the central Plains while departures of +4°F and +7°F were common from the east slopes of the central Rockies to the East Coast. Near to slightly above normal conditions were reported across the coastal sections of California and much of Alaska with a couple locations recording weekly departures up to +5°F.

In sharp contrast, unseasonably cold conditions gripped a large part of the Rockies and Intermountain West as a storm spread wintry conditions from Utah to Montana (see Table 3). Readings into the teens at some locations produced record daily lows and weekly departures between -8°F and -12°F in Utah and Wyoming. Departures between -3°F and -7°F were common from eastern California to northwestern Montana. In Alaska, slightly below normal conditions were confined to a few scattered locations, with departures reaching -6°F in Kotzebue.

TABLE 1. Selected stations with 3.50 or more inches of precipitation during the week of April 7-13, 1991.

<u>STATION</u>	<u>TOTAL (INCHES)</u>	<u>STATION</u>	<u>TOTAL (INCHES)</u>
BOSSIER CITY/BARKSDALE AFB, LA	14.30	JACKSON, MS	5.06
SHREVEPORT, LA	13.87	SITKA, AK	4.74
ILIAMNA, AK	8.04	ALEXANDRIA/ENGLAND AFB, LA	4.48
LITTLE ROCK AFB, AR	6.72	TEXARKANA, AR	4.26
JACKSONVILLE NAS, FL	6.08	WATERLOO, IA	4.21
MONROE, LA	5.92	WEST PLAINS, MO	4.09
YAKUTAT, AK	5.64	COLUMBUS/LOCKBOURNE AFB, OH	3.97
LITTLE ROCK, AR	5.61	COLUMBUS AFB, MS	3.96
EL DORADO, AR	5.56	JONESBORO, AR	3.90
MEMPHIS NAS, TN	5.48	VALPARAISO/EGLIN AFB, FL	3.81
MEMPHIS, TN	5.43	JACKSON, TN	3.61
PINE BLUFF, AR	5.21		

OBSERVED PRECIPITATION
April 7 - 13, 1991



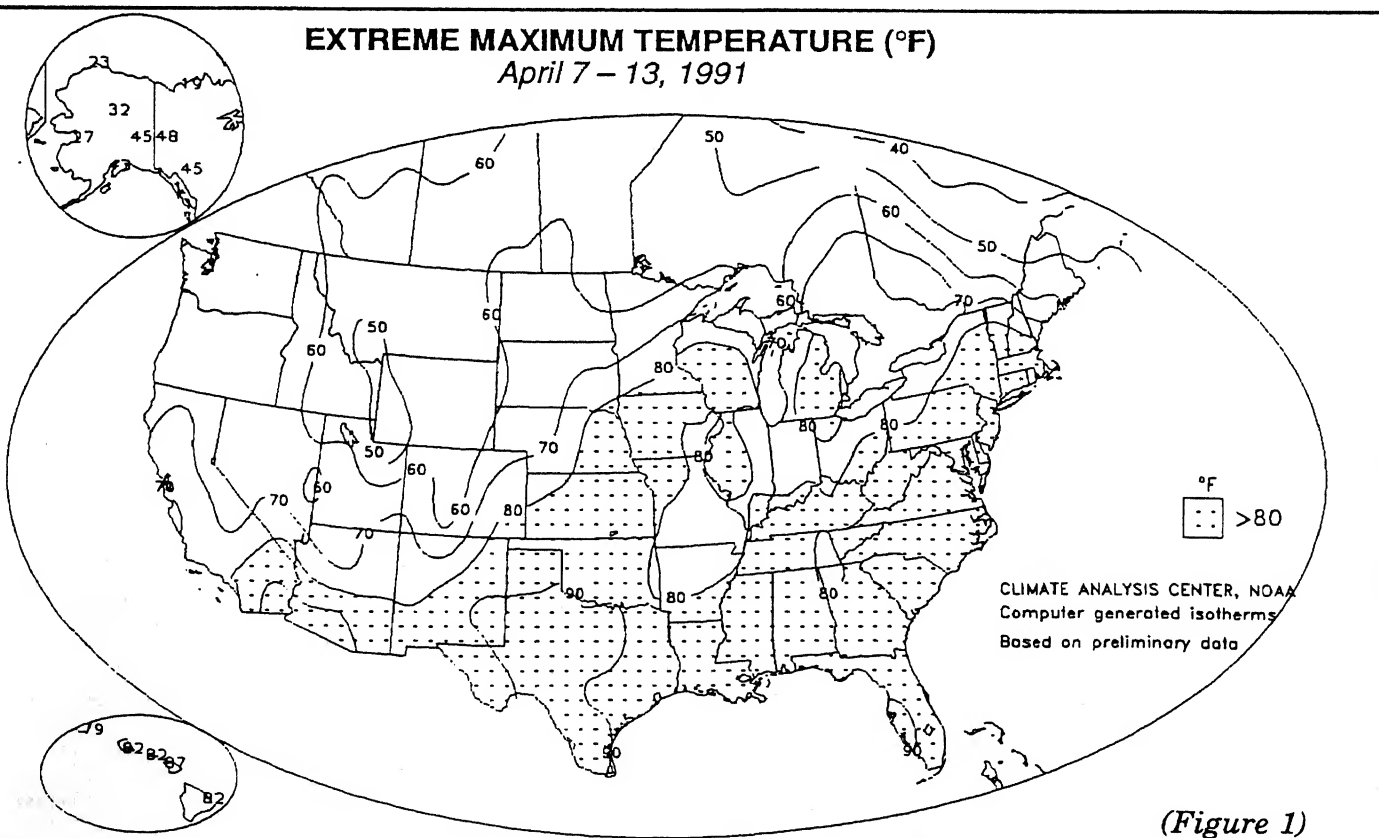
DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)
April 7 - 13, 1991

TABLE 2. Selected stations with temperatures averaging 8.5°F or more ABOVE normal for the week of April 7-13, 1991.

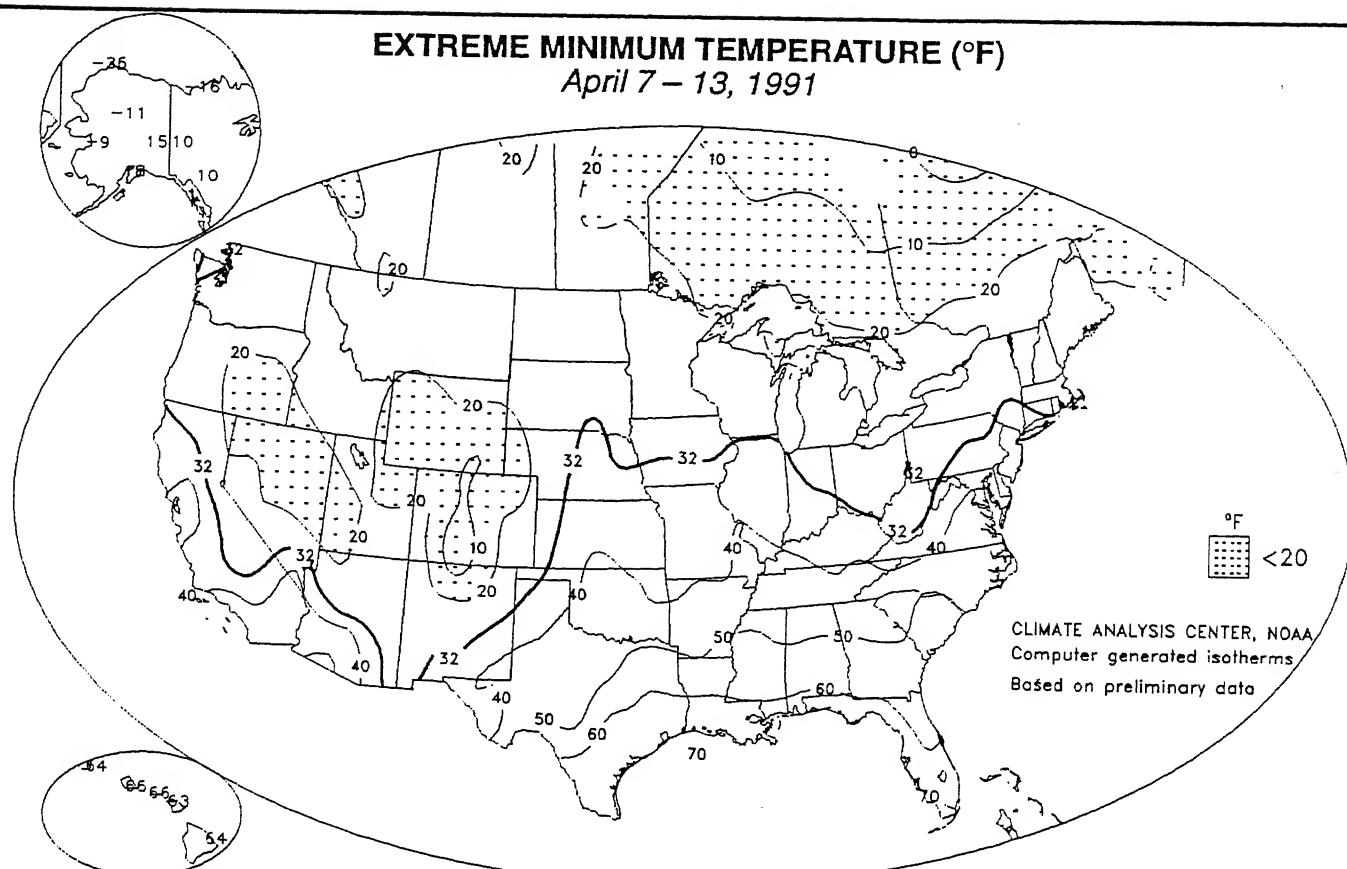
STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
NEW YORK/LA GUARDIA, NY	+12.1	61.9	ROCHESTER, NY	+9.0	52.9
HARTFORD, CT	+11.8	58.5	AUSTIN/BERGSTROM AFB, TX	+8.9	75.2
BINGHAMTON, NY	+10.6	52.6	WICHITA, KS	+8.9	63.2
NEWARK, NJ	+10.5	60.6	NEW YORK/KENNEDY, NY	+8.9	57.4
PATUXENT RIVER NAS, MD	+10.2	62.9	UTICA, NY	+8.9	51.2
BRIDGEPORT, CT	+10.1	56.8	SALINA, KS	+8.8	61.2
ERIE, PA	+10.1	53.6	BUFFALO, NY	+8.7	51.8
BRADFORD, PA	+10.0	50.8	MT. WASHINGTON, NH	+8.7	29.1
BURLINGTON, VT	+10.0	50.1	NORFOLK, VA	+8.6	65.2
ALBANY, NY	+9.9	54.3	PHILADELPHIA, PA	+8.6	59.7
POUGHKEEPSIE, NY	+9.6	55.6	RUSSELL, KS	+8.6	59.7
SYRACUSE, NY	+9.6	53.4	ALLENTOWN, PA	+8.6	56.6
MONTPELIER, VT	+9.6	48.1	WILKES-BARRE, PA	+8.6	54.8
PROVIDENCE, RI	+9.5	55.6	MERIDIAN, MS	+8.5	71.7
GLENS FALLS, NY	+9.5	52.1	CONCORD, NH	+8.5	50.3
GOLDSBORO/JOHNSON AFB, NC	+9.1	68.7	MASSENA, NY	+8.5	48.8

TABLE 3. Selected stations with temperatures averaging 5.0°F or more BELOW normal for the week of April 7-13, 1991.

STATION	DEPARTURE (°F)	AVERAGE (°F)	STATION	DEPARTURE (°F)	AVERAGE (°F)
OGDEN/HILL AFB, UT	-10.5	37.5	LANDER, WY	-6.6	33.7
WORLAND, WY	-8.0	35.3	GRAND JUNCTION, CO	-6.4	43.1
ROCK SPRINGS/SWEETWATER, WY	-7.9	29.8	KOTZEBUE, AK	-6.3	3.0
CEDAR CITY, UT	-7.7	37.6	LARAMIE, WY	-5.8	29.5
CASPER, WY	-7.3	32.8	ELY, NV	-5.8	33.6
SHERIDAN, WY	-7.0	33.8	BOZEMAN, MT	-5.5	34.1
ELKO, NV	-6.9	34.9	CHEYENNE, WY	-5.4	34.4
BILLINGS, MT	-6.9	35.6	WINNEMUCCA, NV	-5.0	38.7
SALT LAKE CITY, UT	-6.9	40.3			

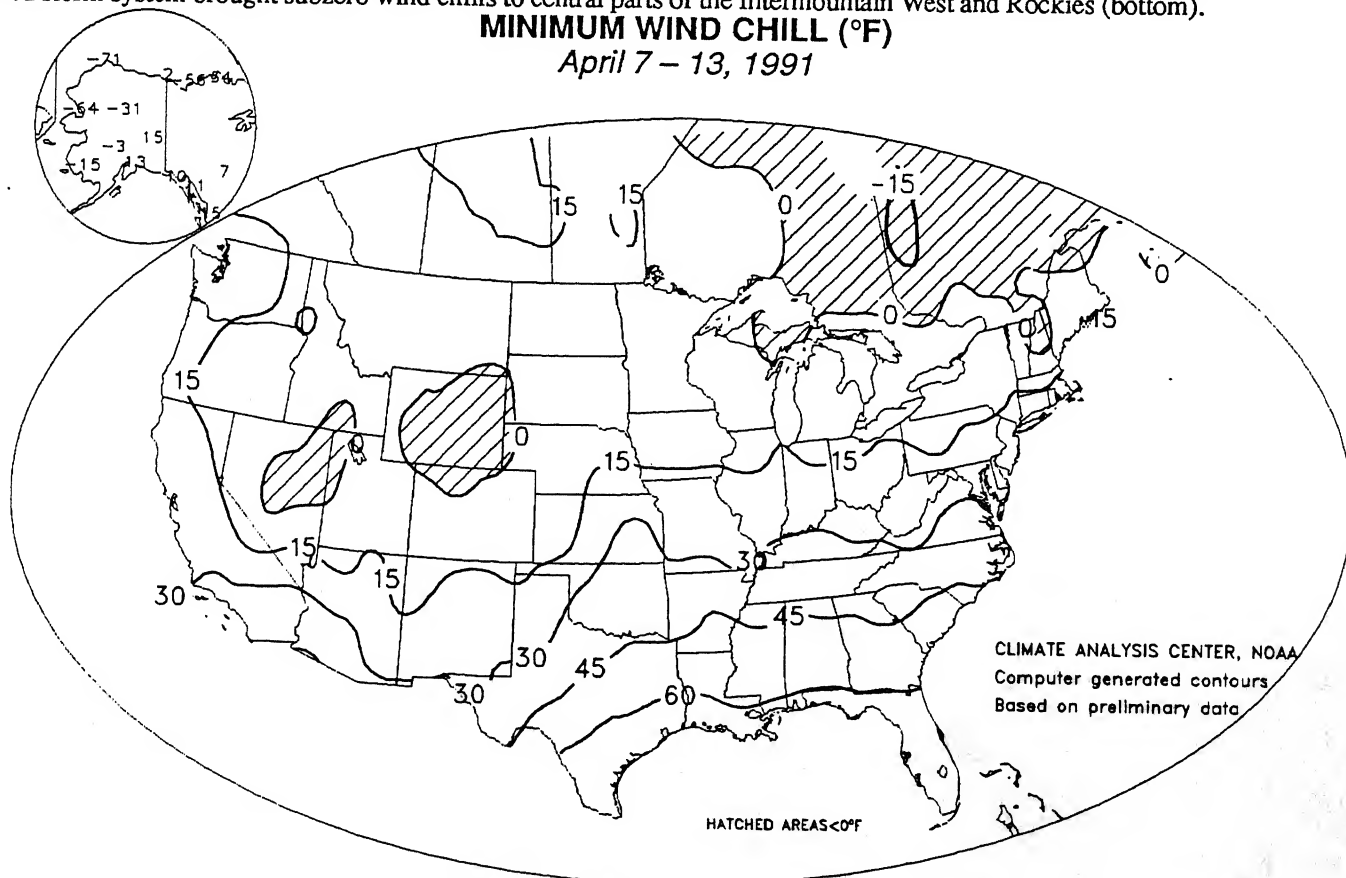


EXTREME MINIMUM TEMPERATURE (°F) *April 7 – 13, 1991*

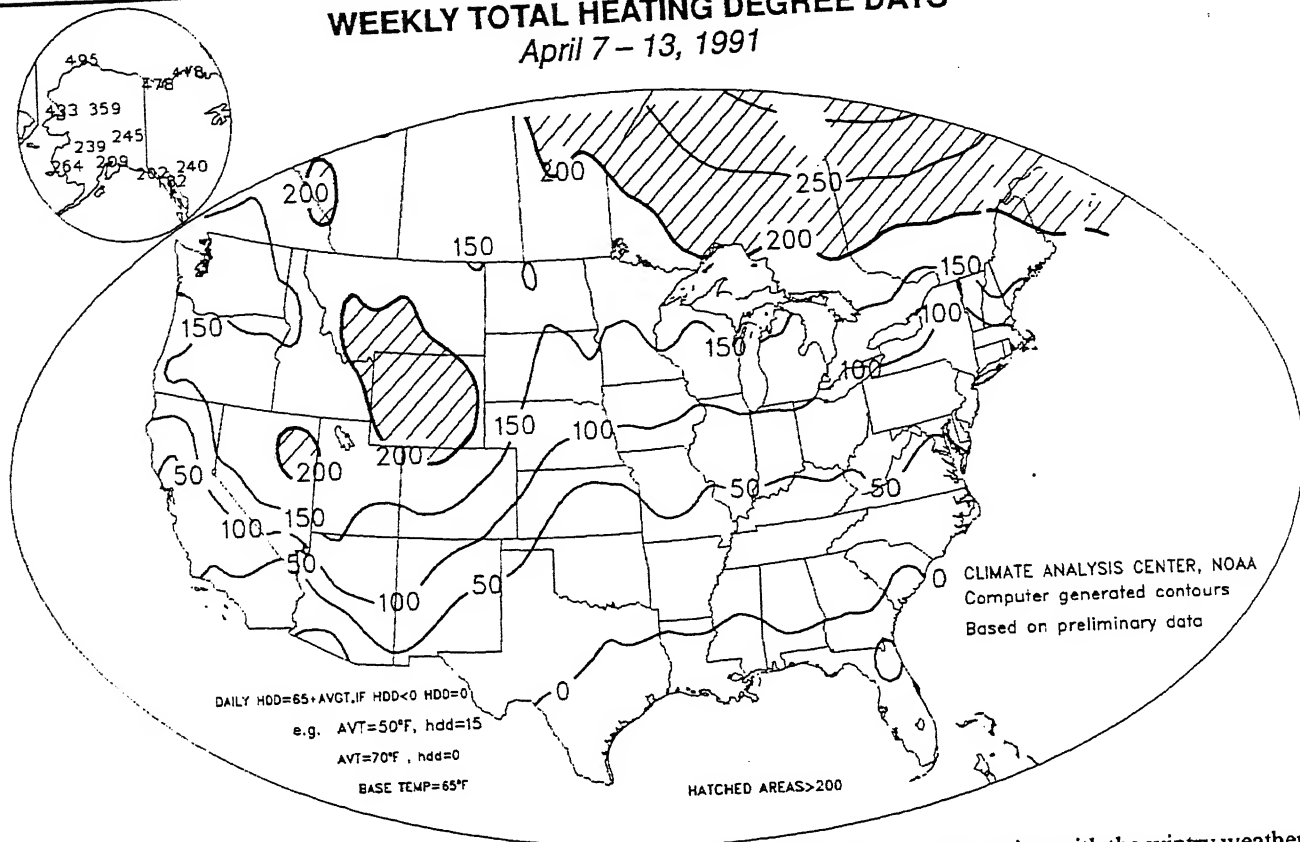


A strong storm system deepening across the Rockies and High Plains brought sharply contrasting weather to the nation. The East experienced May-like conditions while parts of the Rockies and Plains endured another heavy snowfall. Temperatures along most of the eastern seaboard remained above freezing all week while lows dropped into the single digits in the higher elevations of the Colorado Rockies (top). Typically mild April wind chills caused few problems during the week; however, northerly gusts associated with the aforementioned storm system brought subzero wind chills to central parts of the Intermountain West and Rockies (bottom).

MINIMUM WIND CHILL (°F) *April 7 – 13, 1991*

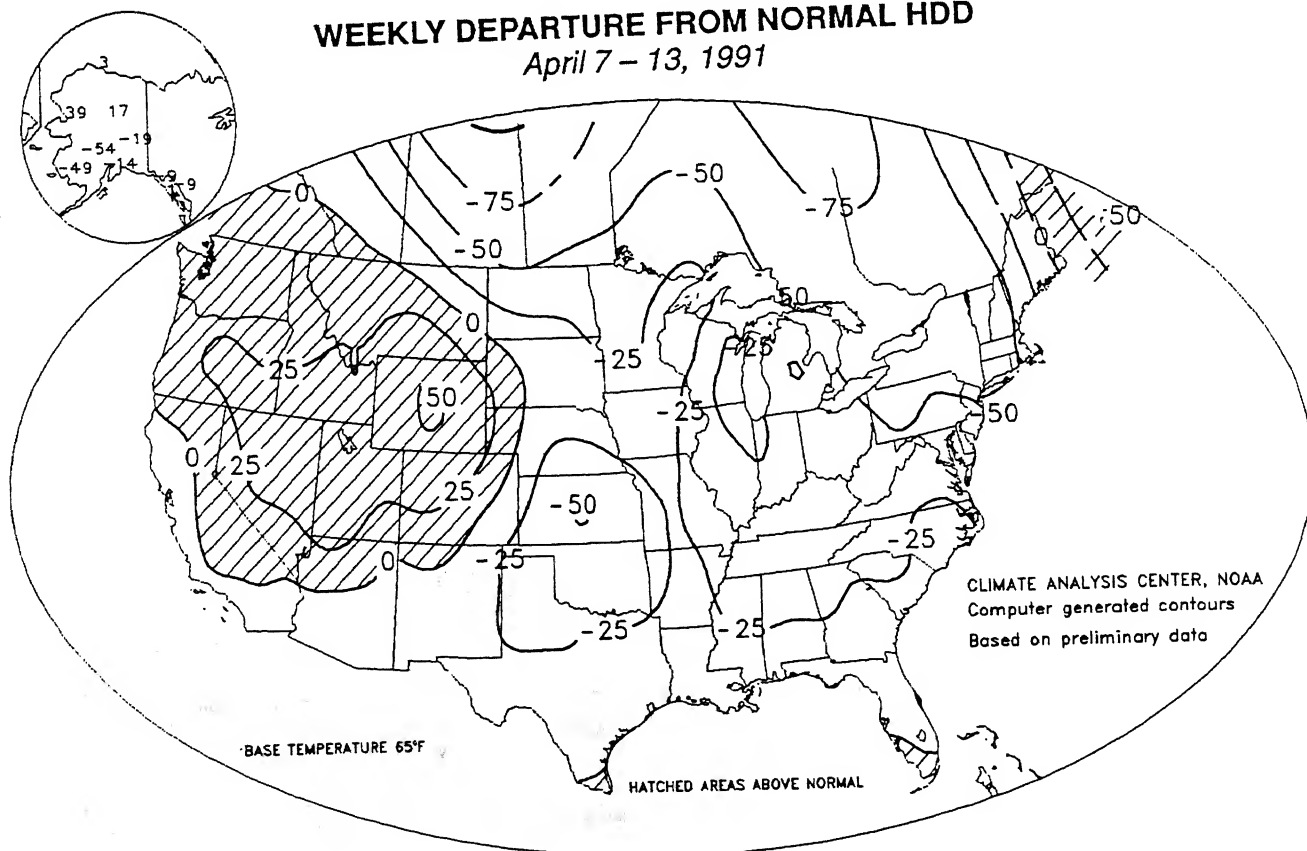


WEEKLY TOTAL HEATING DEGREE DAYS April 7 - 13, 1991



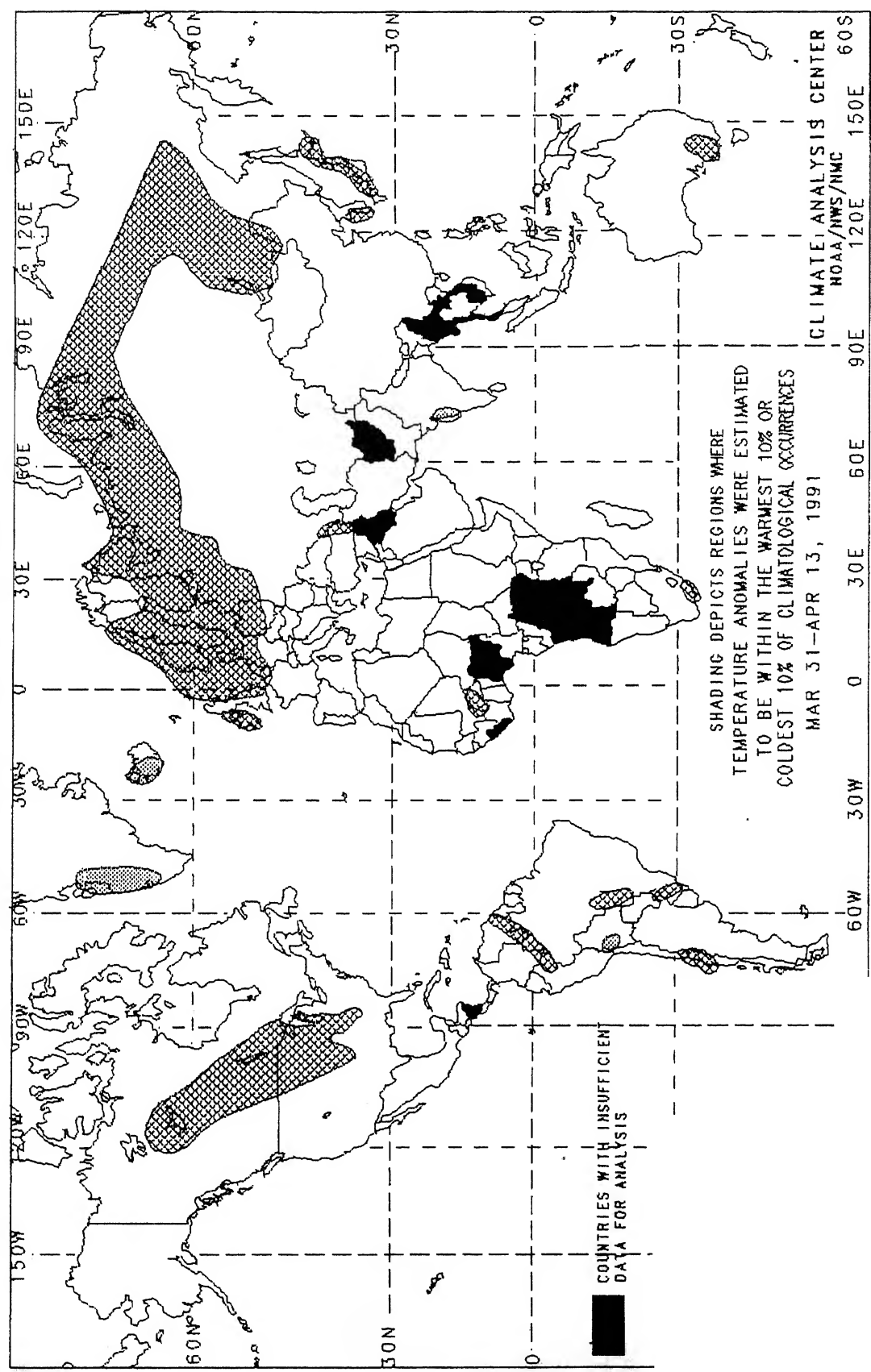
Heating usage was seasonably light across most of the country but exceeded 200 HDD's in conjunction with the wintry weather in the eastern Great Basin and Rockies, as well as in extreme northern Maine (top). East of the Rockies, in the mild air drawn northward ahead of the storm system, heating demand was below normal for the week (bottom).

WEEKLY DEPARTURE FROM NORMAL HDD April 7 - 13, 1991



2-WEEK GLOBAL TEMPERATURE ANOMALIES

MARCH 31 - APRIL 13, 1991



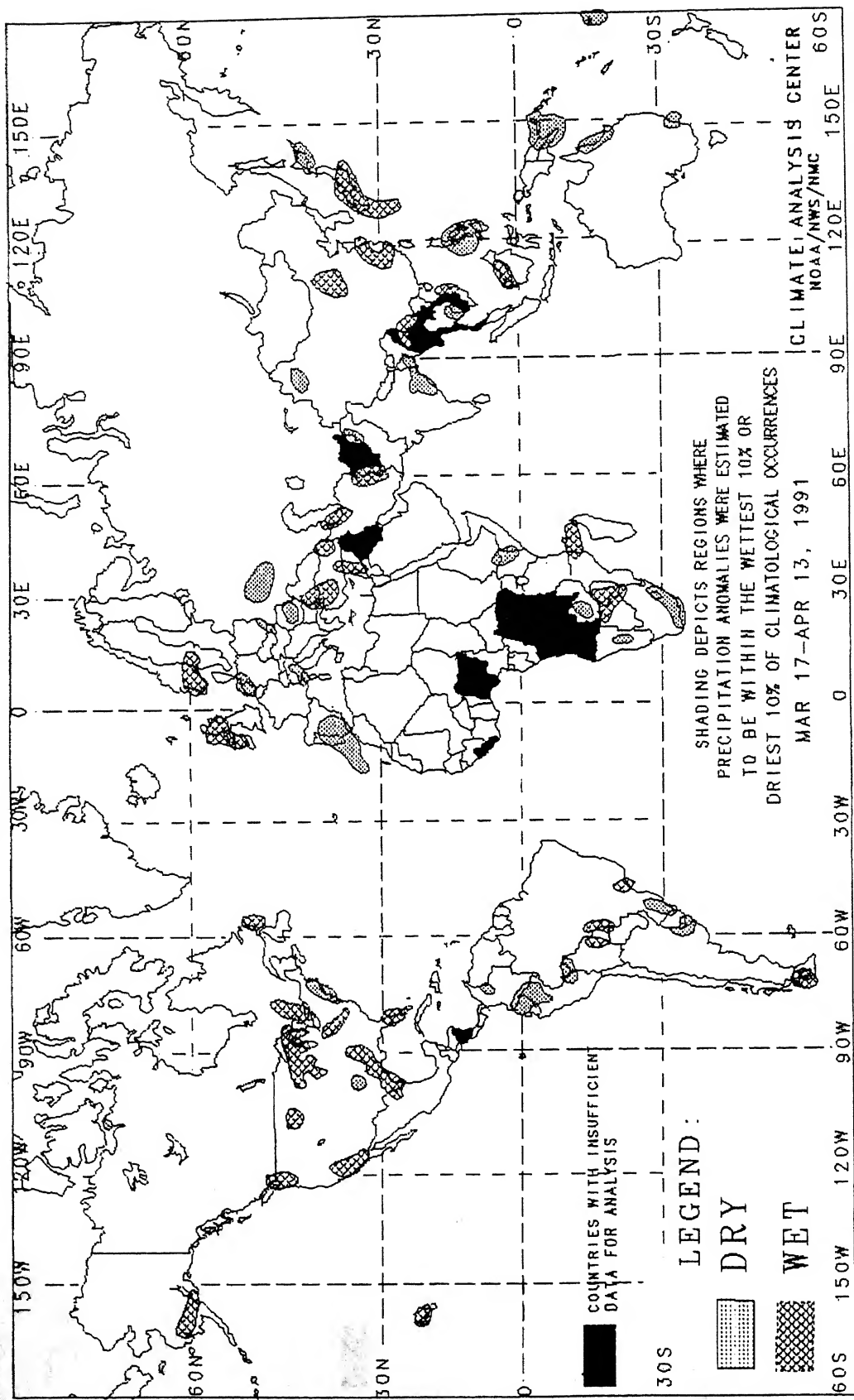
approximately 2500 observing stations were received from synoptic basis so many night time observations the estimated error may have resulted in an error magnitude of temperature

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

4-WEEK GLOBAL PRECIPITATION ANOMALIES

MARCH 17 - APRIL 13, 1991



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

